

Re: calculus

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- *From:* "erehwon" <duff@xxxxxxxxxxxx>
 - *Date:* Tue, 13 Dec 2005 21:33:59 +0000 (UTC)
-

ok thx for the help. I shall go read up some more...
take care,
JJ

"Robert Low" <mtx014@xxxxxxxxxxxxxxxx> wrote in message
news:405f47F1846abU1@xxxxxxxxxxxxxxxx

> erehwon wrote:

>> Can someone help with the following logic? I think I am wrong...

>> If free energy of a system is a function of pressure and temperature, we
can

>> write

>> $R = G(p,t)$

>> Using the chain rule, we

>> can write:

>> (1) $dR/dx = dR.dt/dt.dx + dR.dp/dp.dx$

>

> This is pretty messed up: I think that

> you're saying

>

> $dR = R_p dp + R_t dt$

>

> where $_p$ and $_t$ mean partial derivatives wrt p and t

> respectively.

>

> You can interpret this as saying that if p and t are

> functions of some parameter q , then

>

> $dR/dx = R_p dp/dx + R_t dt/dx$

>

> where the first is thinking about R as a function of q

> via the dependence of p and t on q .

>

>

>> (2) comparing like terms gives us:

>> (3) $dR/dt = -S$ (is this correct?)

>> (4) $dR/dp = V$ (is this correct?)

>

> This is (or at least can be made) correct, though

> you really ought to think about what the various

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- > terms mean.
- >
- >> ON THE OTHER HAND Working another way by setting (a) = (b) we get:
- >> $dR.dt/dt + dR.dp/dp = Vdp - Sdt$
- >>
- >> $\Rightarrow dR/dt + dR/dt = Vdp/dt - S$
- >
- > How did $dR.dp/dp$ (whatever that's supposed to mean)
- > divided by dt become dR/dt ?
- >
- > You really need to distinguish partial and ordinary derivatives,
- > or you're just going to get more and more confused. I'd recommend
- > a good revision of several variable calculus before you go
- > much further with thermodynamics.

- *Follow-Ups:*

- ◆ *Re: calculus*

- ◆ *From:* Robert Low

- *References:*

- ◆ *calculus*

- ◆ *From:* erehwon

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- ◆ *From:* Robert Low

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